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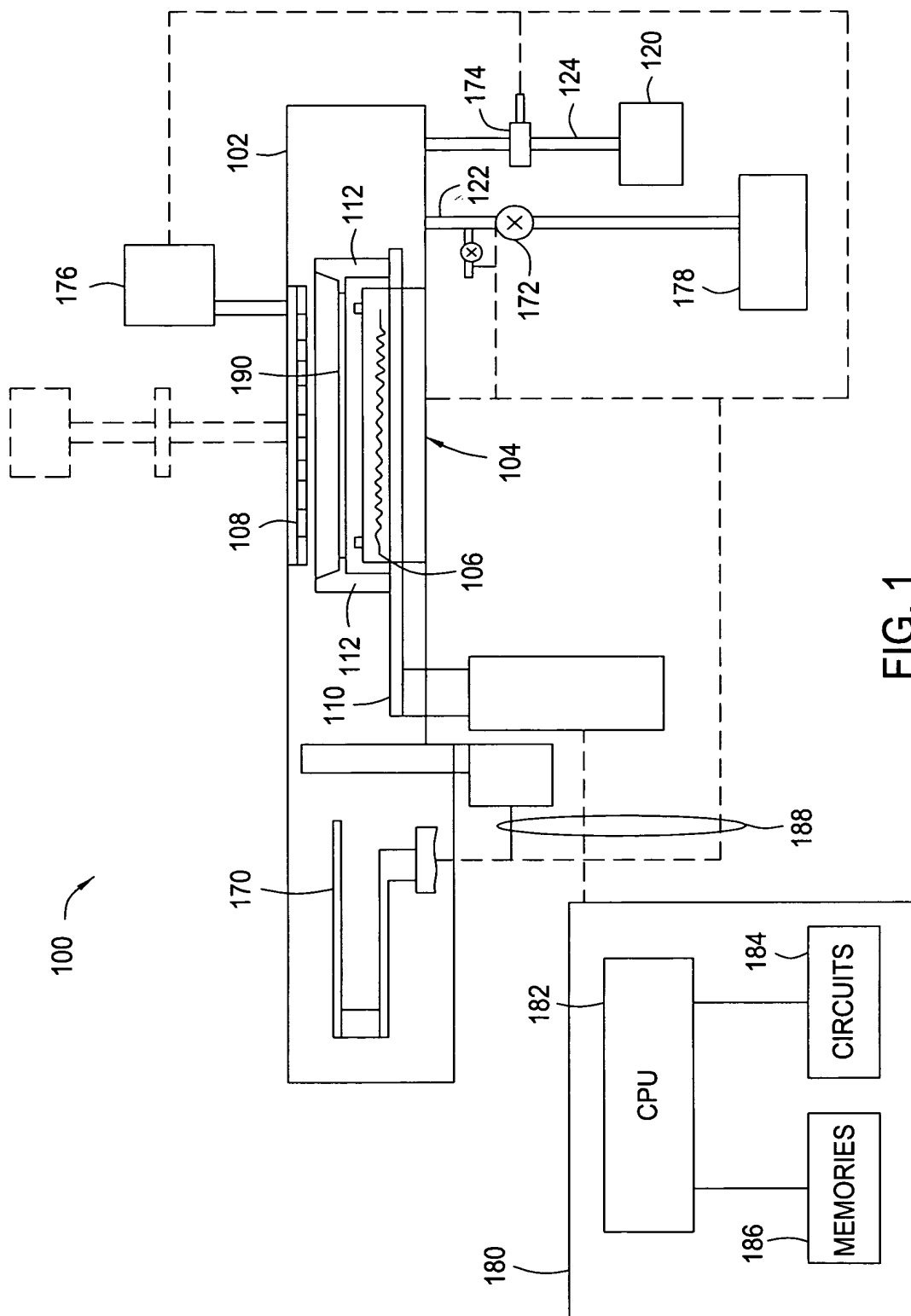
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10/611,589  
JUNE 30, 2003  
APPLIED MATERIALS, INC.  
METHOD AND APPARATUS FOR ANNEALING COPPER FILMS  
CHEN, ET AL.

CONFIRMATION: 5241

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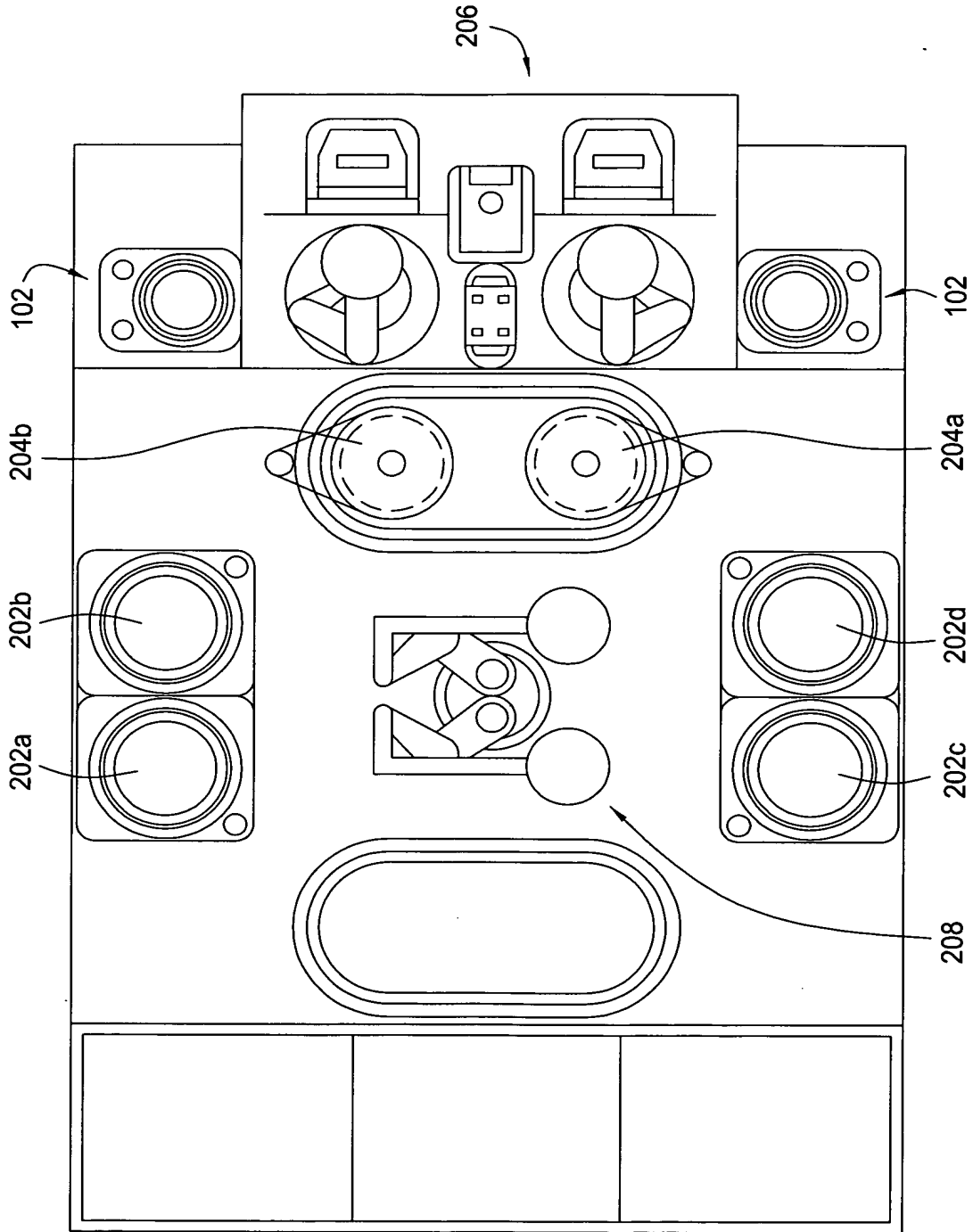


FIG. 2



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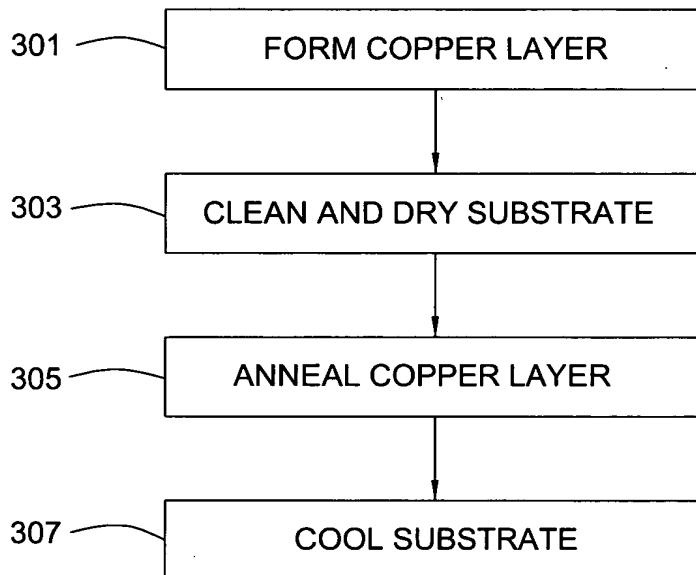


FIG. 3



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FIG. 4A

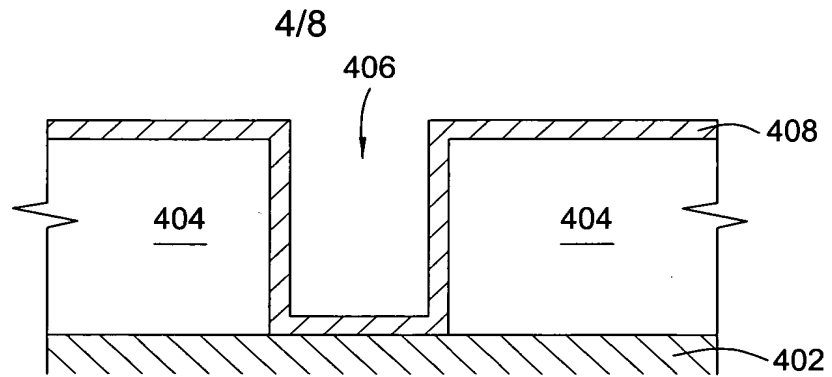


FIG. 4B

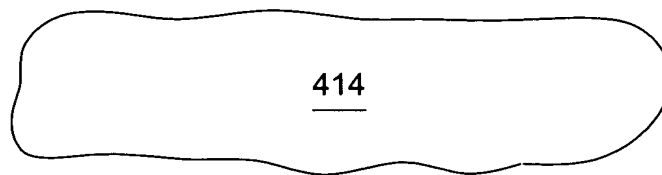
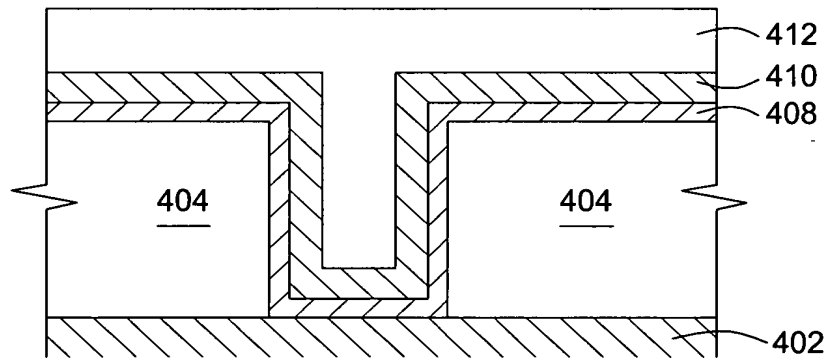
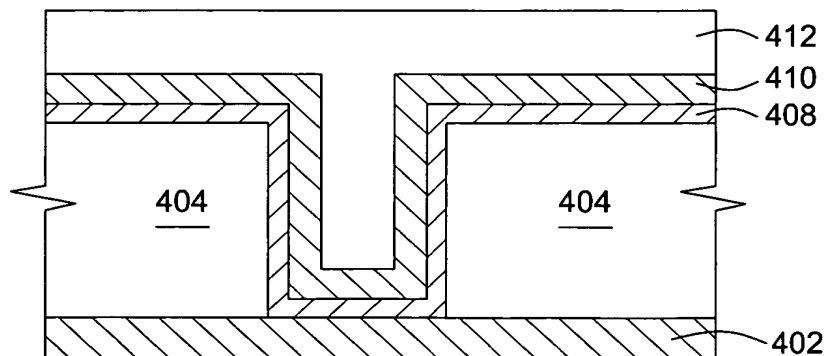


FIG. 4C





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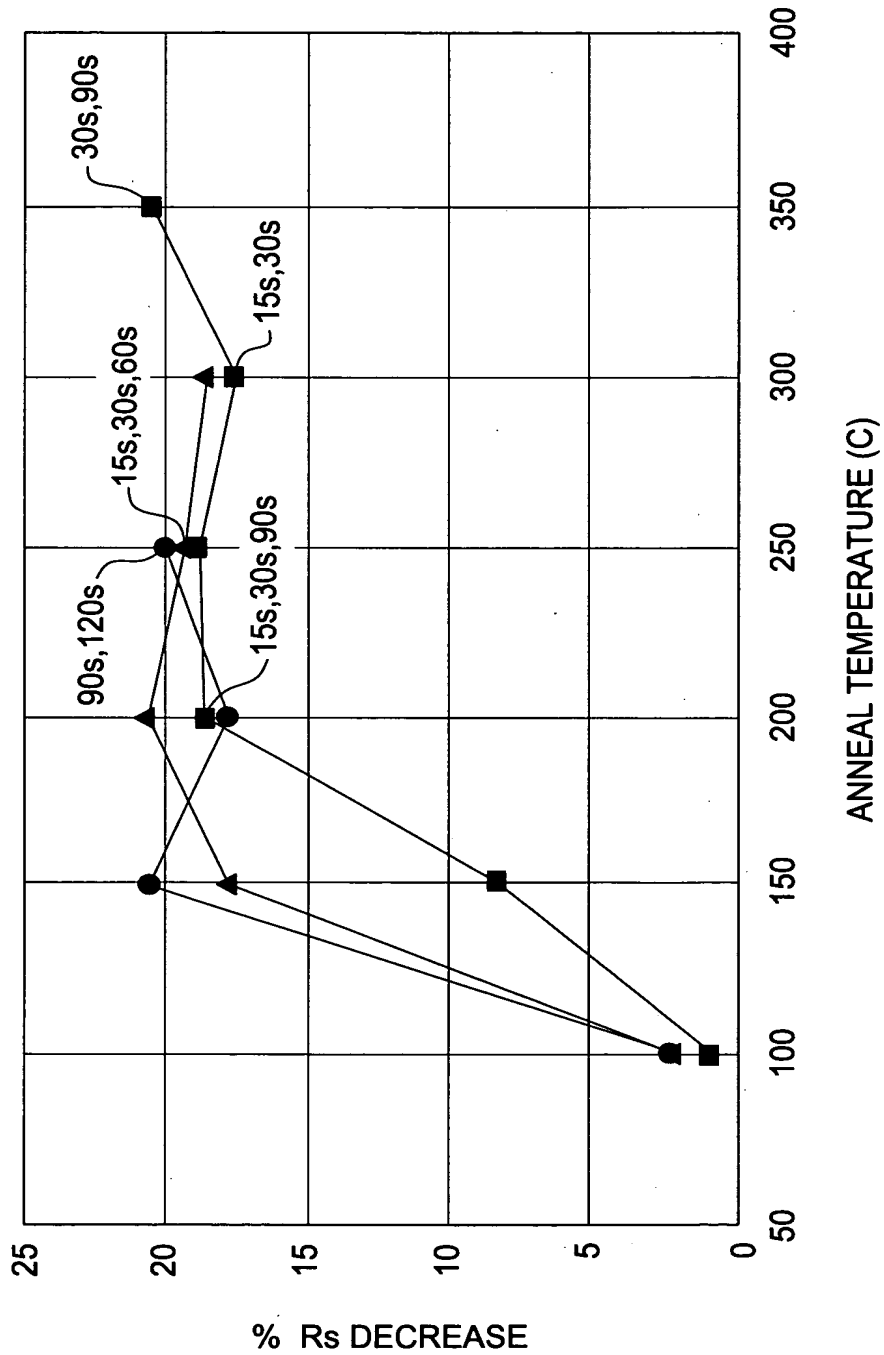
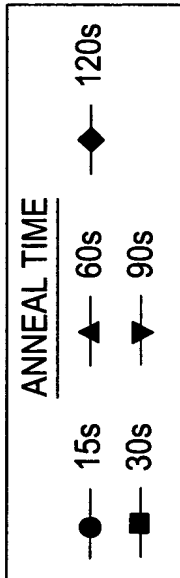
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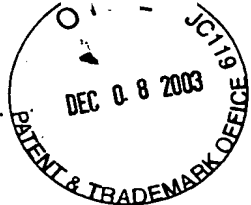
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FIG. 5

FILM STACK:  
10kSiO<sub>2</sub>/250Å TaN/2kÅ IMP CU/  
10kÅ ECP CU  
ANNEAL IN FORMING GAS  
(4%H<sub>2</sub> in N<sub>2</sub>) with < 5 ppm O<sub>2</sub> level



PERCENT Rs CHANGE AS A FUNCTION OF ANNEALING TEMPERATURE AND TIME



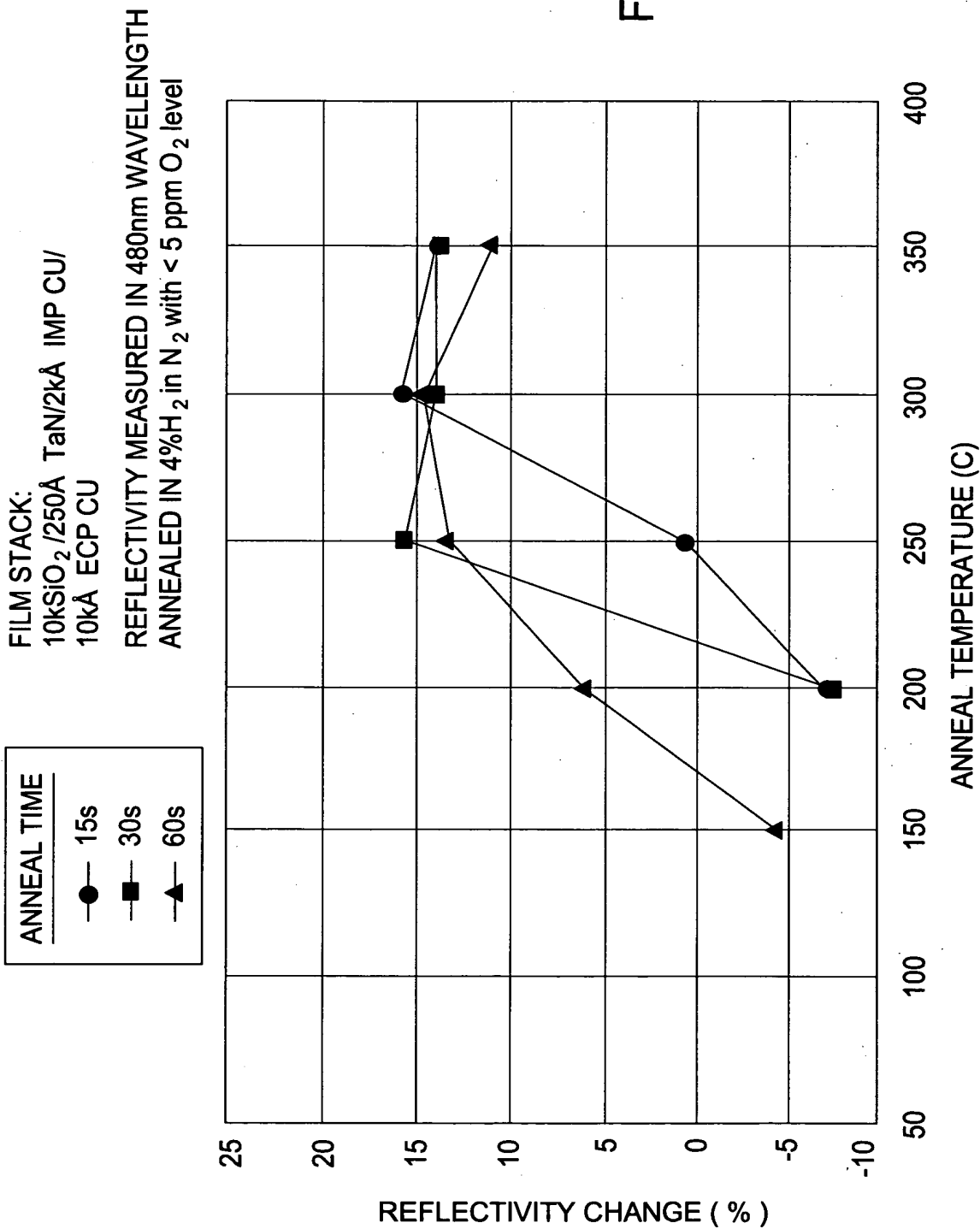
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FIG. 6



ECP COPPER FILM REFLECTIVITY CHANGE AS A FUNCTION OF ANNEALING TEMPERATURE AND TIME



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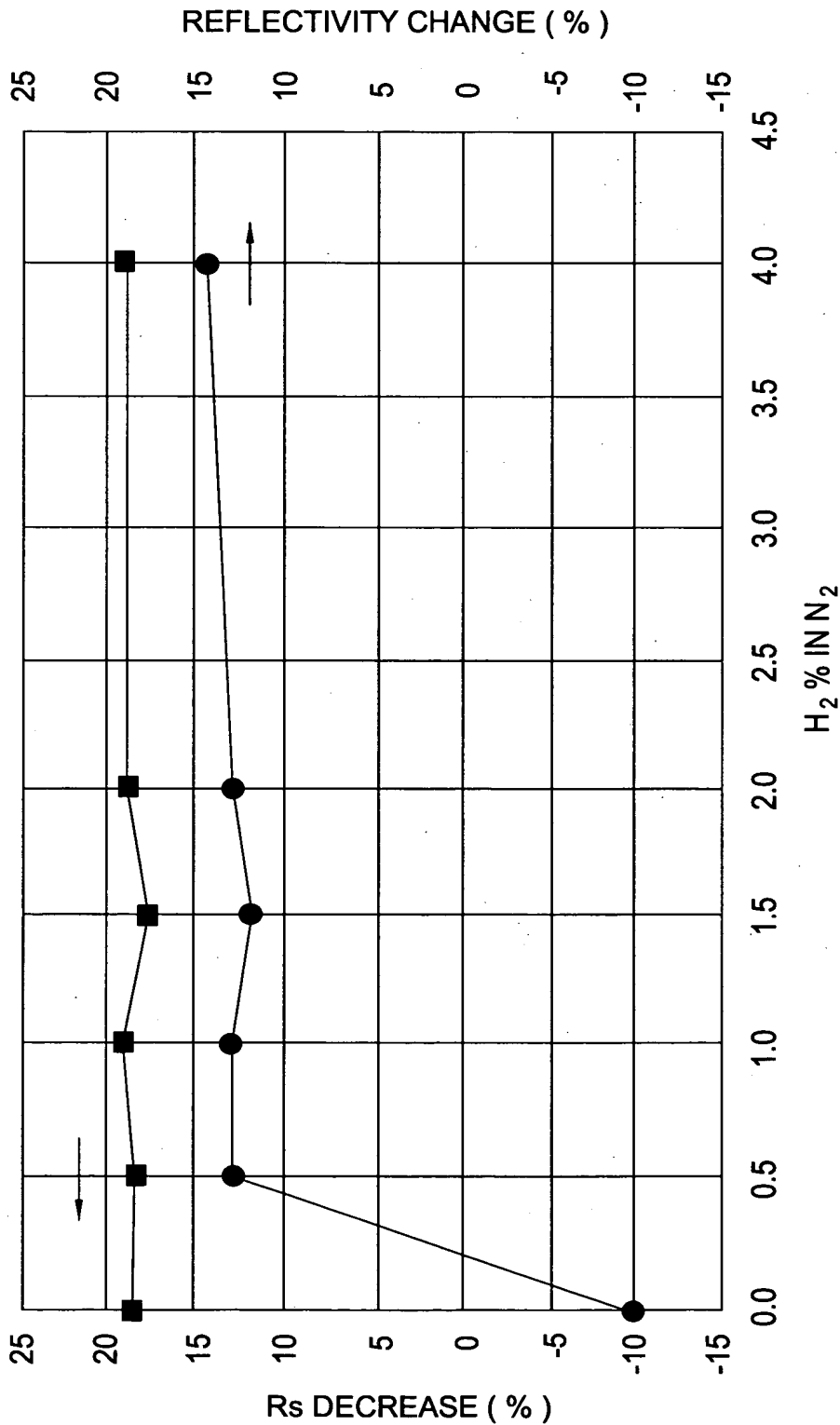
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FIG. 7

FILM STACK:  
10kSiO<sub>2</sub>/250Å TaN/2kÅ IMP CU/  
10kÅ ECP CU  
ANNEALED AT 300C IN <5ppm O<sub>2</sub> LEVEL ATMOSPHERE  
REFLECTIVITY MEASURED AT 480nm WAVELENGTH



Rs DROP AND REFLECTIVITY CHANGE AS A FUNCTION OF HYDROGEN CONTENT IN CHAMBER





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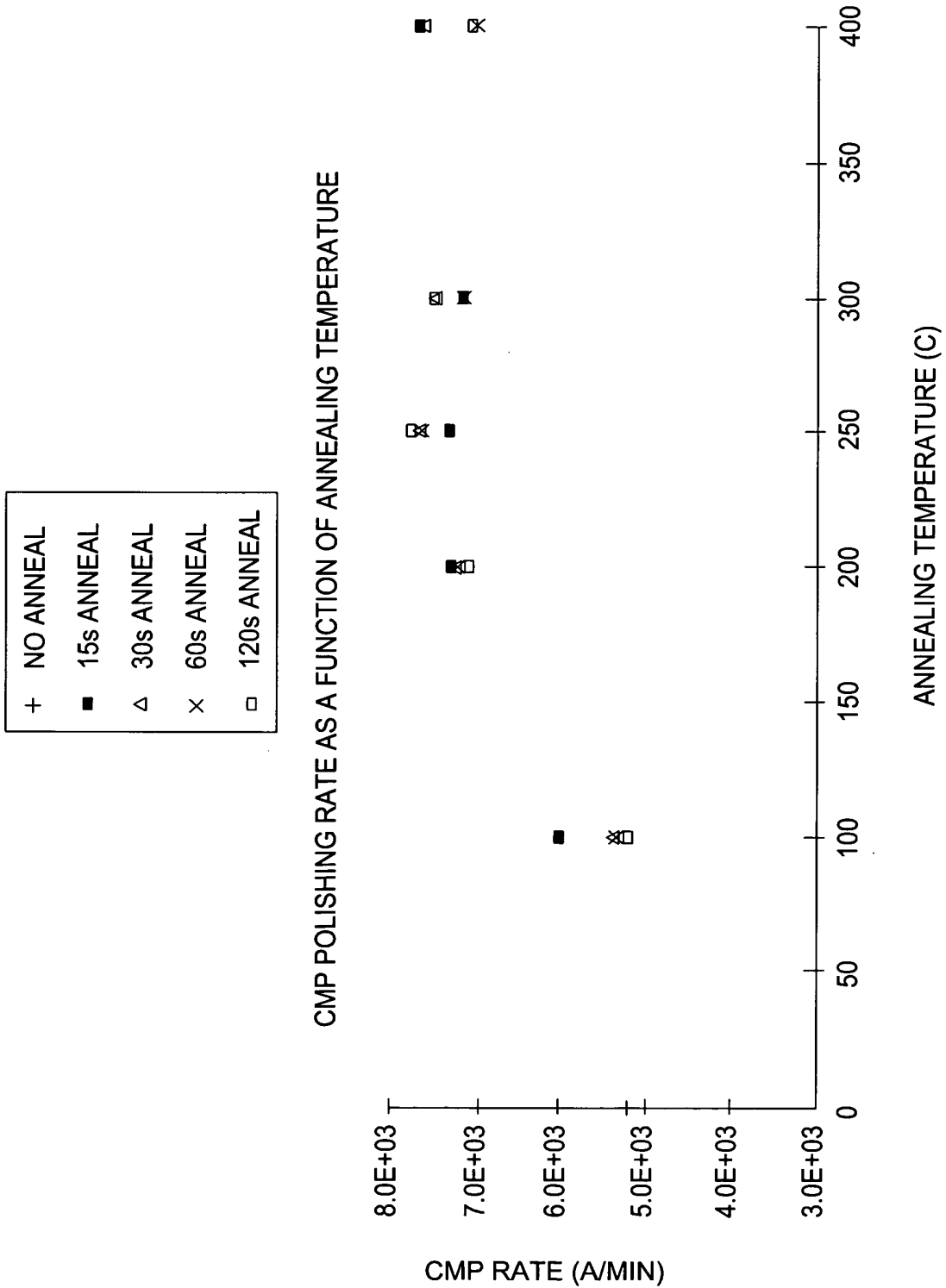


FIG. 8